

# GaAs-IR-Lumineszenzdiode

## GaAs Infrared Emitter

### SFH 409



#### Wesentliche Merkmale

- GaAs-LED mit sehr hohem Wirkungsgrad
- Hohe Zuverlässigkeit
- Hohe Impulsbelastbarkeit
- Gute spektrale Anpassung an Si-Fotoempfänger
- Gehäusegleich mit SFH 309, SFH 487

#### Anwendungen

- IR-Fernsteuerungen von Fernseh-, Rundfunk- und Videogeräten, Lichtdimmern
- Lichtschranken bis 500 kHz
- Münzzähler
- Sensorik
- Diskrete Optokoppler

#### Features

- Very highly efficient GaAs-LED
- High reliability
- High pulse handling capability
- Good spectral match to silicon photodetectors
- Same package as SFH 309, SFH 487

#### Applications

- IR remote control for hifi and TV sets, video tape recorders, dimmers
- Light-reflection switches (max. 500 kHz)
- Coin counters
- Sensor technology
- Discrete optocouplers

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 409	Q62702-P860	3-mm-LED-Gehäuse (T 1), grau eingefärbt, Anschlüsse im 2.54-mm-Raster ( $\frac{1}{10}$ "),
SFH 409-2	Q62702-P1002	Kathodenkennzeichnung: kürzerer Anschluß 3 mm LED package (T 1), grey-colored epoxy resin, solder tabs lead spacing 2.54 mm ( $\frac{1}{10}$ "), cathode marking: short lead

**Grenzwerte ( $T_A = 25\text{ °C}$ )****Maximum Ratings**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 40 ... + 100	°C
Sperrspannung Reverse voltage	$V_R$	5	V
Durchlaßstrom Forward current	$I_F$	100	mA
Stoßstrom, $\tau \leq 10\ \mu\text{s}$ , $D = 0$ Surge current	$I_{FSM}$	3	A
Verlustleistung Power dissipation	$P_{tot}$	165	mW
Wärmewiderstand Thermal resistance	$R_{thJA}$	450	K/W

**Kennwerte ( $T_A = 25\text{ °C}$ )****Characteristics**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der Strahlung Wavelength at peak emission $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\lambda_{peak}$	950	nm
Spektrale Bandbreite bei 50% von $I_{max}$ Spectral bandwidth at 50% of $I_{max}$ $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Delta\lambda$	55	nm
Abstrahlwinkel Half angle	$\varphi$	$\pm 20$	Grad deg.
Aktive Chipfläche Active chip area	$A$	0.09	mm <sup>2</sup>
Abmessungen der aktiven Chipfläche Dimensions of the active chip area	$L \times B$ $L \times W$	$0.3 \times 0.3$	mm
Abstand Chipoberfläche bis Linsenscheitel Distance chip surface to lens top	$H$	2.6	mm
Kapazität, $V_R = 0\text{ V}$ Capacitance	$C_o$	25	pF

Kennwerte ( $T_A = 25\text{ °C}$ )

Characteristics (cont'd)

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Schaltzeiten, $I_e$ von 10% auf 90% und von 90% auf 10%, bei $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$ Switching times, $I_e$ from 10% to 90% and from 90% to 10%, $I_F = 100\text{ mA}$ , $R_L = 50\ \Omega$	$t_r$ , $t_f$	0.5	$\mu\text{s}$
Durchlaßspannung, Forward voltage $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$	$V_F$ $V_F$	1.30 ( $\leq 1.5$ ) 1.9 ( $\leq 2.5$ )	V V
Sperrstrom, Reverse current, $V_R = 5\text{ V}$	$I_R$	0.01 ( $\leq 1$ )	$\mu\text{A}$
Gesamtstrahlungsfluß, Total radiant flux $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$	$\Phi_e$	15	mW
Temperaturkoeffizient von $I_e$ bzw. $\Phi_e$ , $I_F = 100\text{ mA}$ Temperature coefficient of $I_e$ or $\Phi_e$ , $I_F = 100\text{ mA}$	$TC_I$	- 0.55	%/K
Temperaturkoeffizient von $V_F$ , $I_F = 100\text{ mA}$ Temperature coefficient of $V_F$ , $I_F = 100\text{ mA}$	$TC_V$	- 1.5	mV/K
Temperaturkoeffizient von $\lambda_{\text{peak}}$ , $I_F = 100\text{ mA}$ Temperature coefficient of $\lambda_{\text{peak}}$ , $I_F = 100\text{ mA}$	$TC_\lambda$	+ 0.3	nm/K

**Gruppierung der Strahlstärke  $I_e$  in Achsrichtung**gemessen bei einem Raumwinkel  $\Omega = 0.01\text{ sr}$ **Grouping of Radiant Intensity  $I_e$  in Axial Direction**at a solid angle of  $\Omega = 0.01\text{ sr}$ 

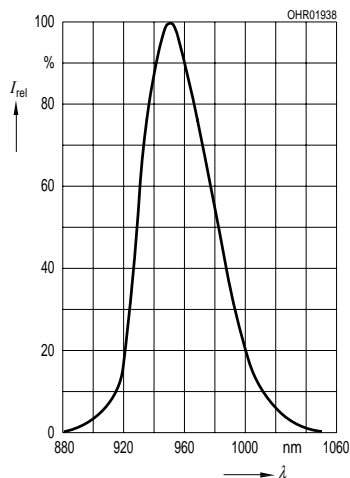
Bezeichnung Parameter	Symbol	Werte Values				Einheit Unit
		SFH 409	SFH 409-1 <sup>1)</sup>	SFH 409-2	SFH 409-3	
Strahlstärke Radiant intensity $I_F = 100\text{ mA}$ , $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$ , $t_p = 100\ \mu\text{s}$	$I_e$ $I_{e\text{ typ.}}$	$\geq 6.3$ -	6.3 ... 12.5 75	> 10 120	16 ... 32 -	mW/sr mW/sr

1) Nur auf Anfrage lieferbar.

1) Available only on request.

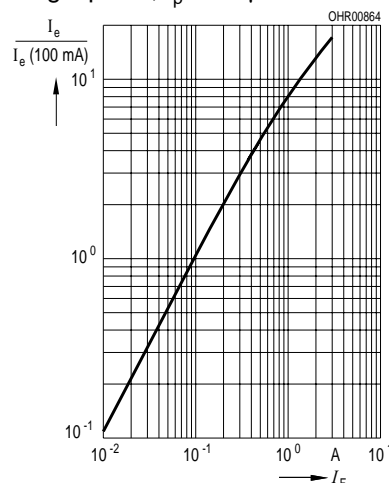
**Relative Spectral Emission**

$I_{rel} = f(\lambda)$



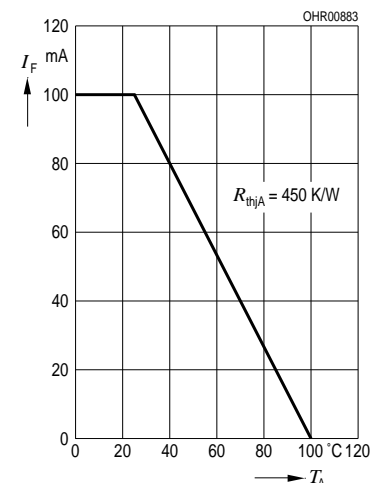
**Radiant Intensity**  $\frac{I_e}{I_e 100 \text{ mA}} = f(I_F)$

Single pulse,  $t_p = 20 \mu\text{s}$



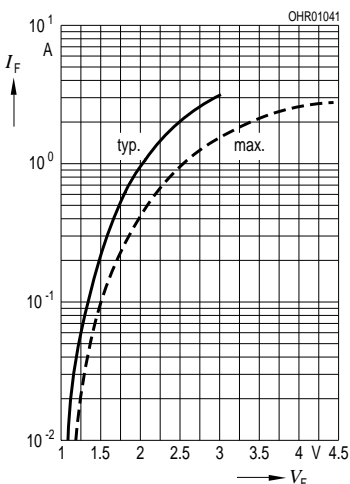
**Max. Permissible Forward Current**

$I_F = f(T_A)$



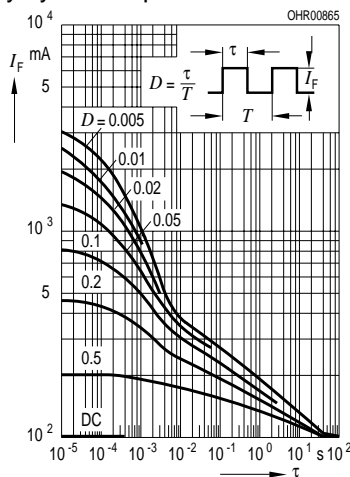
**Forward Current**

$I_F = f(V_F)$ , Single pulse,  $t_p = 20 \mu\text{s}$

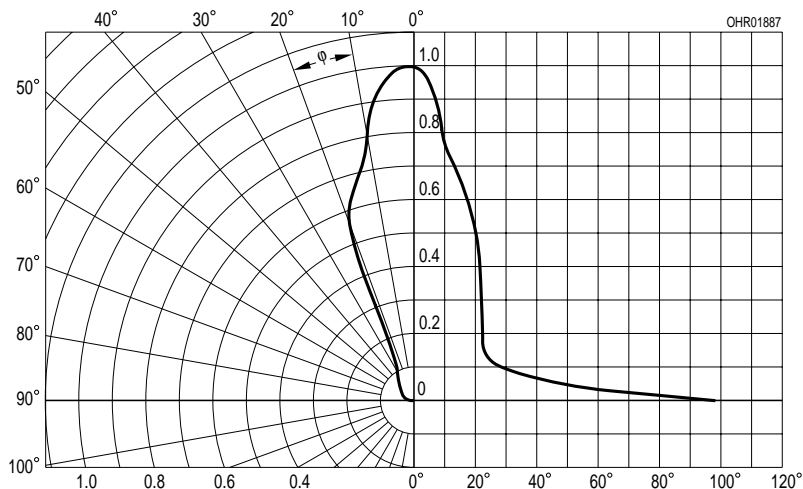


**Permissible Pulse Handling Capability**

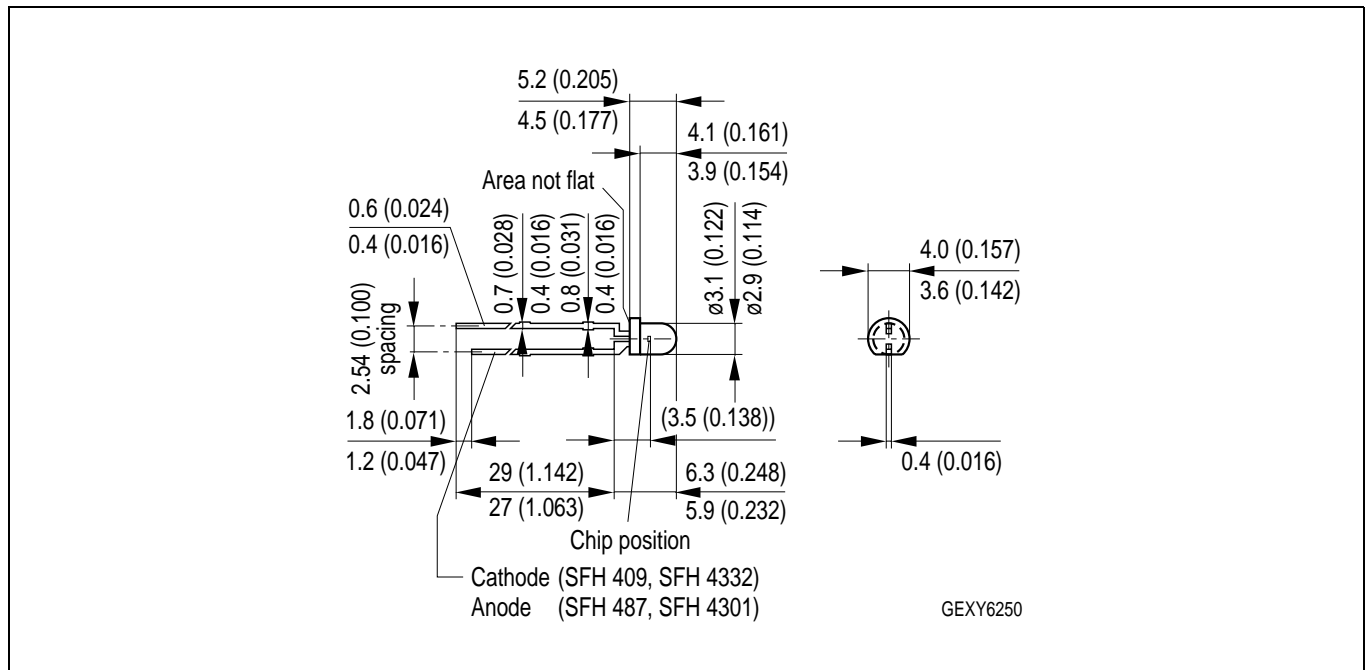
$I_F = f(\tau)$ ,  $T_A = 25^\circ\text{C}$   
duty cycle  $D = \text{parameter}$



**Radiation Characteristics**  $I_{rel} = f(\varphi)$



## Maßzeichnung Package Outlines



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

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### Attention please!

The information describes the type of component and shall not be considered as assured characteristics. Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances. For information on the types in question please contact our Sales Organization.

### Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

**Components used in life-support devices or systems must be expressly authorized for such purpose!** Critical components <sup>1</sup>, may only be used in life-support devices or systems <sup>2</sup> with the express written approval of OSRAM OS.

<sup>1</sup> A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or effectiveness of that device or system.

<sup>2</sup> Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered.